CLAIMS

Claim 1: A radius end mill in which end cutting edges and substantially arc-shaped corner cutting edges are formed on a tool body that is rotated around an axis, comprising:

chip discharge flutes, which are helically twisted, formed on an outer circumference of a distal end portion of the tool body;

main gash faces whose angle of inclination with respect to the axis is a smaller angle than a twist angle of the chip discharge flutes, said main gash faces formed on inner circumferential sides of distal end portions of wall surfaces of the chip discharge flutes that face in a direction of rotation of the tool, the end cutting edges formed on a distal end of the main gash faces; and

sub gash faces whose angle of inclination with respect to the axis has been made greater than that of the main gash faces, said sub gash faces formed on an outer circumferential side of the main gash faces such that they extend away via step portions from the main gash faces,

wherein the corner cutting edges that have a protruding arc-shaped contour are formed so as to be continuous with an outer circumferential side of the end cutting edges from a distal end as far as an outer circumference of the sub gash faces.

Claim 2: A radius end mill according to claim 1, wherein step portions between the main gash faces and the sub gash faces are formed as inclined surfaces that move gradually away as they move from the main gash face side towards the sub gash face side.

Claim 3: A radius end mill according to claim 2, wherein an angle of inclination of the inclined surfaces formed by the step portions is within a range of 30° to 60° with respect to a direction that is perpendicular to the sub gash faces.

Claim 4: A radius end mill according to claim 2, wherein the inclined surfaces are formed as concave curved surfaces.

Claim 5: A radius end mill in which end cutting edges and substantially arc-shaped corner cutting edges are formed on a tool body that is rotated around an axis, wherein:

inner edges of rake faces of the end cutting edges and inner edges of rake faces of the corner cutting edges are formed as a single, smoothly continuous convex curve.

Claim 6: A radius end mill according to claim 5, wherein the rake face of the end cutting edge and the rake face of the corner cutting edge are formed as a single, smoothly continuous curved surface.

Claim 7: A radius end mill according to claim 5, wherein a ratio r/D between a radius of curvature "r" of the substantially arc-shaped portions formed by the corner cutting edges and the diameter D of the tool body is set to 0.2 or more.

Claim 8: A radius end mill according to claim 5, wherein the radius of curvature "r" of the substantially arc-shaped portions formed by the corner cutting edges is set to (D – d) / 2 or more for the diameter D and the web thickness "d" of the tool body.

Claim 9: A tool body having a radius end mill in which end cutting edges and substantially arc-shaped corner cutting edges are formed on the tool body that is rotated around an axis, comprising:

chip discharge flutes, which are helically twisted, formed on an outer circumference of a distal end portion of the tool body;

main gash faces whose angle of inclination with respect to the axis is a smaller angle than a twist angle of the chip discharge flutes, said main gash faces formed on inner circumferential sides of distal end portions of wall surfaces of the chip discharge flutes that face in a direction of rotation of the tool, and the end cutting edges formed on a distal end of the main gash faces; and

sub gash faces whose angle of inclination with respect to the axis has been made greater than that of the main gash faces, said sub gash faces formed on an outer circumferential side of the main gash faces such that they extend away via step portions from the main gash faces, and

wherein the corner cutting edges that have a protruding arc-shaped contour are formed to be continuous with an outer circumferential side of the end cutting edges from a distal end as far as an outer circumference of the sub gash faces.

Claim 10: A radius end mill according to claim 9, wherein step portions between the main gash faces and the sub gash faces are formed as inclined surfaces that move gradually away as they move from the main gash face side towards the sub gash face side.

Claim 11: A radius end mill according to claim 10, wherein an angle of inclination of the inclined surfaces formed by the step portions is within a range of 30° to

60° with respect to a direction that is perpendicular to the sub gash faces.

Claim 12: A radius end mill according to claim 10, wherein the inclined surfaces are formed as concave curved surfaces.

5